

### **Amendments to the Claims**

This listing of claims will replace all previous versions, and listings, of claims in the application.

1. (currently amended) Method for the production of  $\text{Al}_2\text{O}_3$ /SiC nanocomposite abrasive grains, comprising the steps of: characterized by the fact that  
mixing an aluminum-oxide containing sol is mixed with sinter additives and SiC nanoparticles to obtain a mixture; and  
subsequently gellinged, dryingied, calcinatinged and sintering the mixture,ed the  
sintering being conducted by heating the mixture in the range between 1300°C and  
1600°C.
2. (currently amended) Method according to Claim 1, wherein characterized by the fact  
that the aluminum-oxide containing sol contains as a solid component superfinely  
dispersed aluminum oxide monohydrate of the Boehmite type, aluminum alkoxides,  
aluminum halogenides and/or aluminum nitrate.
3. (currently amended) Method according to either Claim 1 or Claim 2, wherein the  
characterized by the fact that that the addition of the SiC nanoparticles are mixed is done  
in an amount of between 0.1 and < 5 mol %, preferably in the range of 0.3 and 2.5 mol %  
relative to the aluminum contents of the mixture, calculated as  $\text{Al}_2\text{O}_3$ .
4. (previously presented) Method according to either of Claims 1 or 2, wherein that prior  
to the gelling, sintering additives in the form of crystallization seeds, crystal growth  
inhibitors and/or other modifying components that influence the sintering process are  
added.
5. (currently amended) Method according to Claim 4, wherein characterized by the fact  
that fine-particled  $\alpha$  aluminum oxide is used as crystallization seed.

6. (currently amended) Method according to either of Claims 1 or 2, wherein the gelling of the suspensions occurs by increasing or decreasing the pH value, through aging, the addition of electrolytes, increased temperature, and/or concentrating the solution.
7. (currently amended) Method according to either of Claims 1 or 2, wherein the drying of the gel is carried out in a temperature range between 50 °C and 120 °C, with subsequent calcination between 500 °C and 800 °C, and sintering in a temperature range between 1300 °C and 1600 °C.
8. (currently amended) Method according to Claim 7, wherein the characterized by the fact that sintering is done in a temperature range between 1380 °C and 1500 °C.
9. (currently amended) Method according to Claim 7, wherein the characterized by the fact that sintering is carried out under inert conditions.
10. (previously presented) Method according to either of Claims 1 or 2, wherein comminution to the desired grain size is done before or after sintering.
11. (currently amended)  $\text{Al}_2\text{O}_3/\text{SiC}$  nanocomposite abrasive grain with a hardness of > 16 GPa, a density of > 95% of the theory, and an SiC portion of between 0.1 and < 5 mol %, relative to the  $\text{Al}_2\text{O}_3$  matrix, wherein characterized by the fact that the SiC particles are present in the  $\text{Al}_2\text{O}_3$  matrix as well as intragranularly and the abrasive grain shows a performance factor  $\text{LF}_{25} > 75\%$  in the single-grain scratch test.
12. (currently amended)  $\text{Al}_2\text{O}_3/\text{SiC}$  nanocomposite abrasive grain according to Claim 11, wherein characterized by the fact that the SiC portion preferably amounts to between 0.3 and < 2.5 mol %, relative to the  $\text{Al}_2\text{O}_3$  matrix.

13. (previously presented)  $\text{Al}_2\text{O}_3/\text{SiC}$  nanocomposite abrasive grain according to either of Claims 11 or 12, wherein the  $\text{SiC}$  particles are predominantly present intragranularly in the  $\text{Al}_2\text{O}_3$  matrix.
14. (previously presented)  $\text{Al}_2\text{O}_3/\text{SiC}$  nanocomposite abrasive grain according to either of Claims 11 or 12, wherein the  $\text{Al}_2\text{O}_3$  crystals of the matrix show mean diameters of between 0.2  $\mu\text{m}$  and 20  $\mu\text{m}$ .
15. (previously presented)  $\text{Al}_2\text{O}_3/\text{SiC}$  nanocomposite abrasive grain according to either of Claims 11 or 12, wherein the  $\text{Al}_2\text{O}_3$  matrix has a submicron structure and a mean particle size of < 1  $\mu\text{m}$ , preferably < 0.5  $\mu\text{m}$ .
16. (currently amended)  $\text{Al}_2\text{O}_3/\text{SiC}$  nanocomposite abrasive grain according to Claim 15, wherein characterized by the fact that coarse  $\text{Al}_2\text{O}_3$  crystals are formed in the submicron  $\text{Al}_2\text{O}_3$  matrix.
17. (currently amended)  $\text{Al}_2\text{O}_3/\text{SiC}$  nanocomposite abrasive grain according to Claim 16, wherein characterized by the fact that the coarse  $\text{Al}_2\text{O}_3$  crystals have a mean diameter of > 2  $\mu\text{m}$ , preferably > 5  $\mu\text{m}$ .
18. (currently amended)  $\text{Al}_2\text{O}_3/\text{SiC}$  nanocomposite abrasive grain according one of Claims 16 or 17, wherein characterized by the fact that the coarse  $\text{Al}_2\text{O}_3$  crystals have an oblong shape.
19. (previously presented)  $\text{Al}_2\text{O}_3/\text{SiC}$  nanocomposite abrasive grain according to either of Claims 16 through 18, wherein the coarse  $\text{Al}_2\text{O}_3$  crystals have a length/width ratio of between 2:1 and 10:1, preferably between 4:1 and 6:1.
20. (currently amended) Grinding belts or grinding disks, comprising Utilization of  $\text{Al}_2\text{O}_3/\text{SiC}$  nanocomposite abrasive grains according to Claim 11 in combination with

backing substrates or materials to comprise grinding belts or grinding disks.